Abstract

The prime significance of Geographic Information System as a multidisciplinary data integrating, analyzing and visualizing tool depends on the organization of data encompassed within the system. This notion calls for the indispensability of structuring diverse raw data with the intention to establish a functional and robust Geodatabase model that safeguard the consistency and integrities of spatial information management.

This research work deals with the process of Georelational GIS data modeling, designing and implementation of a wide spectrum coastal-marine measurement data.

To let the research task set in motion; raw coastal related issues have been discussed under the perspective of Coastal Zone Environment. GIS building block entities were selected. Their conceptual interrelationships have been diagrammatically illustrated. SQL's DDL applied to execute the physical creation, determine dimension, storage and constraints of the entities in an ODBC compliant RDBMS. Likewise, GIS geographic elements were produced applying spatial programs and their integration with attribute database led to the hatching of the object relational GIS.

Topologic operations pertaining to gap detection, segmentation, removal of redundant geographic elements was performed using topology clean up spatial and editing tools.

Georeferencing of the coastal maps have been performed using a provided ellipsoid and datum (PSAD56) of a case study area (Guayaquil estuary, Ecuador).

Interoperability tests among variety GIS applications show feature-transfer-related lose of spatial features properties but successful regeneration of spatial pointers. The process shows the possibility of producing or transforming a functional spatial database from a specific GIS application into another one.

Generating object-relational and spatio-temporal queries related to the developed GIS objects resulted in disclosing thematically visualisable spatial maps. The output of the spatial analysis enables us to perform possible spatial correlation of multidisciplinary results and perceive effects associated to certain marine events.